IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant:	Patrick C. St. Germain	
Application No.	10/682,444	
Filed:	October 9, 2003	Art Unit: 3721
For:	APPARATUS FOR MAKING INTERFOLDED PRODUCT	
		Atty. Docket No. SSS-106
Examiner:	Samch H. Tawfik	

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. Real Party in Interest

This application is assigned to Specialty Systems Advanced Machinery, Inc.

2. Related Appeals and Interferences

None.

3. Status of All Claims

Claims 1-10 have been cancelled. Claims 11-16 are pending. Claims 11-16 are under a Final Rejection, and are on appeal.

Claims 11-16 are presented in the CLAIMS APPENDIX hereto. Claim 11 is the sole independent claim.

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4. Status of All Amendments Filed Subsequent to Final Rejection

No claim amendments were filed subsequent to Final Rejection in the present Appeal.

5. Concise Summary of the Claimed Subject Matter

The claimed subject matter is directed to an apparatus for interfolding at least two sheets of material so as to form a web of interfolded sheets. Illustrative apparatus is shown schematically in FIG. 4.

At least two dispensers such as parallel folding boards 14 and 34 receive webs 16 and 36 (page 4, line 16). These webs are first folded longitudinally so as to produce respective folded sheet materials 18 and 38 (page 4, lines, 16-17). The folded sheet materials are then passed through folding rolls 46 and 48 to produce an interfolded product 50 (page 4, lines 17-22).

Claim 11 is the sole independent claim that defines the apparatus. (FIG. 4; page 4, lines 15-22).

Claim 12 is dependent on claim 11 and defines an apparatus where the dispensers provide sheets that have a plurality of longitunally extending fold lines and folds that provide a double "c" shaped fold (FIG. 3 (a); page 3, line 29 to page 4, line 2).

Claim 13 is dependent on claim 11 and defines an apparatus where the dispensers provide sheets that include a plurality of spaced-apart transversely extending perforation lines (page 4, lines 8-14).

Claim 14 is dependent on claim 11 and defines an apparatus that includes knife rolls for clean cutting interfolded sheets of material (FIG. 4; page 4, lines 23-24).

Claim 15 is dependent on claim 11 and defines an apparatus that includes perforating rolls for providing perforations in the interfolded material (FIG. 4; page 4, lines 17-19).

Claim 16 is dependent on claim 11 and specifies that the dispensers that preform the sheets of material are folding boards (FIG. 4; page 4, lines 15-16).

6. Grounds of Rejection to be Reviewed on Appeal

Claims 11 and 13-16 are rejected under 35 U.S.C. 103(a) as unpatentable over Stemmler (U.S. Patent No. 5,088,707) in view of Hermach (U.S. Patent No. 3,942,782).

Claim 12 is rejected under 35 U.S.C. 103(a) as unpatentable over Stemmler in view of Hermach and DuFresne (U.S. Patent No. 4,824,426).

These rejections are not warranted and should be reversed.

7. Argument

The obviousness rejection based on Stemmler in view of Hermach clearly is not warranted, and is not supported by the record. The applied references are not combinable. *Prima facie* obviousness is not established by the aforementioned references.

A. Stemmler Does NOT Disclose Apparatus for Interfolding Sheets of Material That Include At Least One Longitudinal Fold Line and At Least One Fold

At page 2, 4th full paragraph, of the Office Action dated 13 March 2007 the Examiner concedes that the sheets disclosed by Stemmler lack the longitudinal fold line as well as the fold. Stemmler teaches very different expedients. Stemmler teaches the production of numerically correct stacks of interfolded sheets, an event that takes place downstream from the folding rolls. One of ordinary skill would not have had any motivation whatsoever to look upstream of the folding rolls when seeking to improve upon Stemmler's apparatus.

The shortcomings of Stemmler as a reference against the appealed claims is not cured by Hermach. This particular reference merely shows an apparatus for folding (not interfolding) newspaper pages.

B. Stemmler and Hermach Are Not Combinable

Hermach describes an apparatus for folding newspapers. That has nothing to do with interfolding webs of material. There is no reason whatsoever to interfold a newspaper, thereby making it more difficult to unfold for reading. One of ordinary skill most certainly

would not have done so. Besides, the mechanical elements of Hermach's apparatus are vastly different from those of Stemmler (c.f, for example, FIG. 1 of Stemmler with FIG. 2 of Hermach).

It is also improper, as here, to use the appellant's own specification as an instruction book on how to reconstruct the prior art. Panduit Corp. v. Dennison Mfg. Co., 1 U.S.P.Q.2d 1593, 1602 note 29. One of ordinary skill would not have had the appellant's own specification as a guide for assembly at the time this invention was made.

To properly combine the references, there must be some teaching, suggestion or inference in the references themselves that would have led one of ordinary skill in the relevant art to combine the appropriate teachings. That is not the case in this instance.

Here neither Stemmler nor Hermach provide the requisite motivation to pick, choose and assemble the claimed apparatus. Stemmler is concerned about producing numerically correct partial stacks from individual sheets interfolded in conventional manner. Stemmler focuses the attention of one of ordinary skill downstream from the folding rolls to which webs W1 and W2 are fed conventionally. Hermach seeks to expedite the folding and collation of newspaper pages, and has devised an apparatus expressly designed to do so. Hermach, however, does not and cannot interfold newspaper pages. That would have resulted in a product totally unacceptable to the reading public.

Neither Stemmler nor Hermach address the problem (compact packaging) recognized, addressed and solved by the appellant.

C. The Rejection of Claim 12 Is Not Supported by the Record

The Examiner concedes that neither Stemmler nor Hermach disclose a double "c"-shaped fold as called for in claim 12. Neither does DuFresne. The double "c"-shaped fold is illustrated in appellant's FIGURE 3(a) at 118. Nothing of the kind is shown by Stemmler, Hermach or DuFresne. Only zig-zag folds are shown by DuFresne and Stemmler. See, for example, FIG. 3 of DuFresne and FIGS. 6 & 7 of Stemmler.

D. The Rejection of Claim 13 Is Not Supported by the Record

Regarding claim 13, the Examiner merely states that Stemmler's sheets of material include a plurality of spaced-apart, transversely expending perforation lines. That is not enough to support a rejection, especially in view of the Examiner's admission that the sheets disclosed by Stemmler lack the longitudinal fold line as well as the fold. The patentability of each claim must be evaluated in its entirety. That has not been done in this instance.

E. The Rejection of Claims 14 and 15 Is Not Supported by the Record

The mere fact that Stemmler discloses use of knife rolls or perforations in his apparatus does not vitiate the patentability of these particular claims, especially in view of the Examiner's aforementioned admission. The apparatus of Stemmler is different and the sheets to be processed are different as well.

F. The Rejection of Claim 16 IS NOT Supported by the Record

The operation, purpose and the arrangement of parts are all different from what is shown in Hermach. Stemmler does not show or suggest any dispensers for lengths of materials W1 and W2. The Examiner's selection of Hermach is not based on any teaching by Stemmler but only on appellant's own teachings.

8. The *Graham* Requirements for Obviousness Have Not Been Satisfied

In KSR International Co. v. Teleflex, Inc., ____ U.S. ____, 82 U.S.P.Q.2d 1385, 1397 (2007), the Court explained and affirmed the analysis required to support an obviousness rejection under Section 103(a) by stating that the factual inquiries enumerated in Graham v. John Deere Co., 383 U.S. 1 (1966), are the basis for this purpose. These required factual inquiries cannot be supported by the record in this case to justify a rejection based on obviousness.

In particular, the relevant prior art is paper converting art as it pertains to apparatus for interfolding at least two sheets of material to form a web of interfolded sheets. Only one of the applied references, Stemmler, pertains to this art. Hermach, the other reference, pertains to apparatus for folding, not interfolding, of newspapers. As noted hereinabove, one of ordinary skill would not have had any reason to interfold a newspaper, thereby making the newspaper difficult, if not impossible, to read.

As to the differences between the claimed invention and the prior art, the Examiner has focused on similarities rather than differences. See, for example, Office Action of 6/21/2007 at page 2, lines 19-21. There is no basis whatsoever for the contention that Hermach "discloses a similar apparatus." There is no similarity. The Stemmler apparatus and the Hermach apparatus are each designed and built for a different purpose and a different product. The Examiner's contention that one of ordinary skill would have looked to Hermach to improve Stemmler's apparatus lacks the necessary factual underpinnings. As appellant has pointed out time and time again, interfolding has been known for close to 100 years as evidenced by U.S. Patent No. 1,219,239 (1917) of record, yet prior to appellant's invention a folding device upstream of the interfolder rolls has not been utilized. As is well established, the claimed invention must be looked at as a whole. In determining obviousness it is not relevant that some aspects of the claims may have been otherwise known in the art. Jones v. Hardy, 220 U.S.P.Q. 1021, 1025 (Fed. Cir. 1984). Virtually all inventions are necessarily combinations of old elements. One cannot pick and choose among individual parts of assorted prior art references as a mosaic to create a facsimile of the claimed invention. Akzo N.V. v. United States ITC, 1 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1986).

Specific lack of factual underpinnings for dependent claims 12-16, inclusive, are enumerated hereinabove.

The level of ordinary skill in the pertinent art remains unresolved. No findings for this particular prong of the Graham inquiries are of record or can be supported by the record.

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Objective evidence of unobviousness has been ignored, and stands unrebutted. Specifically, the nomination for the IDEA Achievement Award is evidence of unobviousness.

There is no factual basis in this case for the legal conclusion of obviousness.

9. Conclusion

The Stemmler and Hermach references are not combinable to make a *prima facie* case of obviousness. One of ordinary skill would not have even attempted to interfold a newspaper. The selection of Stemmler and Hermach as references in this case clearly has been arrived at by impermissible reliance on the appellant's own specification for guidance. In any event, even the attempted combination of references would not have made the present invention obvious to one of ordinary skill in the art.

The Graham requirements have not been met.

The Final Rejection cannot be sustained.

The Appeal Brief fee of $250.00 has been paid previously. M.P.E.P. 1204.01.

Kindly charge any additional fees, if required, or credit any overpayment concerning this matter to our Deposit Account No. 15-0508.

Respectfully submitted,

September 13, 2007

By _____
Talivaldis Cepuritis (Reg. No. 20,818)

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CLAIMS APPENDIX

Claim 11. An apparatus for interfolding at least two sheets of material for forming a web of interfolded sheets of material, the apparatus comprising:

a) at least two dispensers preforming sheets of material to provide at least one longitudinally extending fold line and at least one fold respectively; and

b) an interfolder downstream from said dispensers and comprising a pair of folding rolls for receiving preformed sheet material from each of the dispensers and producing interfolded sheets of material.

Claim 12. The apparatus of claim 11 wherein the sheets of material respectively include a plurality of longitudinally extending fold lines and a plurality of folds together defining sheets of material incorporating a double "c" shaped fold.

Claim 13. The apparatus of claim 11 wherein the sheets of material respectively include a plurality of spaced-apart transversely extending perforation lines.

Claim 14. The apparatus of claim 11 which includes knife rolls between the dispensers and the folding rolls for clean cutting the preformed sheets of material.

Claim 15. The apparatus of claim 11 which includes perforating rolls between the dispensers and the folding rolls for perforating the preformed sheets of material.

Claim 16. The apparatus of claim 11 wherein the dispensers are folding boards.

EVIDENCE APPENDIX

INDA-IDEA AWARDS NOMINATION, 2007 (Exhibit A)

U.S. Patent No. 1,219,239 to Brown et al.

RELATED PROCEEDINGS APPENDIX

None.

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this APPEAL BRIEF and Appendices (11 pp.), together with Exhibit A hereto (4 pp.) and U.S. Patent No. 1,219,239 (10 pp.), are being transmitted by facsimile transmission to Fax No. 571-273-8300 on September 13, 2007

Talivaldis Cepuritis (Reg. No. 20,818)

Talivaldis Cepuritis

From: Tom Gazdik [tgazdik@ssspecialtysystems.com]
Sent: Friday, January 19, 2007 1:31 PM
To: Talivaldis Cepuritis
Subject: FW: S&S Cheetah nominated for IDEA Achievement Award
Attachments: IDEA07-2 Award Nominations.doc

Good afternoon Tali. This is the nomination announcement along with the nomination papers. If you should require any additional information please do not hesitate to contact us. Thank you and have a great day. TomG

From: Tom Gazdik [mailto:tgazdik@ssspecialtysystems.com]
Sent: Friday, January 05, 2007 7:56 AM
To: 'Michael Jacobsen'
Cc: Susan Stansbury
Subject: RE: S&S Cheetah nominated for IDEA Achievement Award

Good morning Michael. Thank you for your update. That is exciting news for our organization. Below I have highlighted the work "makes". It should be removed from the sentence. Also, if interested, I have the new packaging carton with Z-TAH fold product inserted into it as an example should you require a photograph. Thank you and have a great day. TomG

Tom Gazdik
715-372-8988

S&S SPECIALTY SYSTEMS, INC.
Iron River, WI 54847
www.SSspecialtySystems.com

-----Original Message-----
From: Michael Jacobsen [mailto:mike@jacorpub.com]
Sent: Thursday, January 04, 2007 4:13 PM
To: tgazdik@ssspecialtysystems.com
Subject: S&S Cheetah nominated for IDEA Achievement Award

Tom:

Congratulations are in order for S&S Specialty Systems' selection as one of three finalists in your product category for the prestigious IDEA07 Achievement Awards, co-sponsored by INDA, Association of the Nonwoven Fabrics Industry, and Nonwovens Industry magazine.

Your product the CHEETAH equipment was selected by an independent industry committee as a finalist in the Equipment category from more than 20 other nominations.

For the third consecutive IDEA show, INDA and Nonwovens Industry magazine will recognize the leading companies, individuals and new products in the global engineered fabrics industry. The awards will be presented during IDEA07, April 24-26, 2007, at the Miami Convention Center in Miami Beach, FL.

Here's how the process works: On February 1 we will post the list of three finalists in the five separate categories Roll Goods, Machinery & Equipment, Raw Materials, Short-Life End Product, and Long-Life End Product on the Nonwovens Industry web site at www.nonwovens-industry.com <http://www.nonwovens-industry.com> , as well as on www.inda.org <http://www.inda.org> . Members of the industry are then invited to vote in each category and then the winners are announced during IDEA07.

Although there is nothing for your company to do at this point, I wanted to notify you in advance and to confirm the exact name and description of the product (see below). Please review this and reply to me with any additional information we should include about the product in any promotional materials and on the voting site. We will be announcing the finalists in a series of press releases later this month and in the February issue of Nonwovens Industry, as well as on www.nonwovens-industry.com <http://www.nonwovens-industry.com> web site.

We do ask that all of the finalists plan to attend the ceremony on the second day of IDEA07 in Miami Beach, April 25. I hope you can make plans to attend. More information on IDEA07 is available at www.inda.org <http://www.inda.org> .

I am sending this note to you either because your name was mentioned as the contact person during the nomination process or it was supplied by INDA. Please let me know if I should be sending this information to someone else.

That's it for now. Again, congratulations and I look forward to working with you or someone else in your organization as we take the next steps in the IDEA07 Achievement Awards process and towards IDEA07 in Miami Beach.

I look forward to hearing from you soon.

Sincerely,
Michael Jacobsen
INDA
22 Paterson Avenue
Midland Park, NJ 07432
201-612-6601
201-612-6677 Fax
mjacobsen@inda.org

PRODUCT DESCRIPTION

Company: S&S Specialty Systems Inc.
Product: CHEETAH equipment
CONTACT: Tom Gazdik, TGazdik@SSSpecialtySystems.com
Introduced: February 2006
Description: The new Cheetah C-Fold interfolded cross-folds are compact folded, yet full-size nonwoven items for napkins, food service, cleaning and disposables applications. The Cheetah production lines were designed to produce Z-TAH FOLDS products. This equipment offers unique new product folds with a small folded "footprint" that opens to a full-size napkin. The resulting compact package size makes gives marketers new options for packaging, shipping and store shelf space strategies.

Benefits of the Cheetah technology include:

€ Cheetah machinery specializes in inter-folded products with production readiness to meet new market demands of soft, high-stretch nonwovens.

- Cheetah equipment delivers a very compact package that dispenses a full-size product.
- It offers new options for packages that consume less space on a retail shelf or industrial storage space.
- Cheetah products appeal to take-along and travel markets because of the small package size.
- Cheetah product features serve the toweling industry for food service and industry cleaning and hand wiping.

INDA - IDEA AWARDS NOMINATION

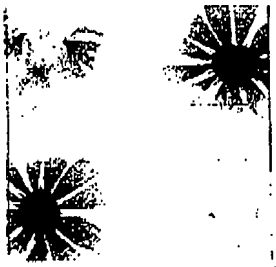
✓ **Short Life End Use**

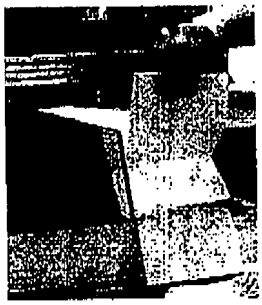
Company Name: S&S Specialty Systems Inc.

Product Name: Z-TAH Folds.

Product Description: Z-TAH FOLDS brings convenience and elegance back to napkins that use airlaid nonwovens with linen and "woven-look" emboss patterns. This unique new product fold has a small folded "footprint" that opens to a full-size napkin. Its compact package size makes it easy for designers to create packs that can sit out on the counter and table rather than languishing on the pantry shelf.

It's also ideal for other disposables including wipers, "towels" and cleaning "cloths." The Z-TAH FOLDS solution helps conserve shipping shelf space, from the factory to the store aisle. With marketers looking for new options for disposable products, Z-TAH FOLDS offers new configurations.





(Sample box to be provided)

S&S Specialty Systems' patent-pending developments, under the Z-TAH FOLDS brand name include interfolded cross-folds, off-set interfolded products and off-set interfolded products with a gap to shorten the cut-off length. Benefits of this technology include:

- Being able to deliver a very compact package that dispenses a full-size product.
- Offering new options for packages that consume less space on a retail shelf or industrial storage space.
- Appealing to take-along and travel markets because of the small package size.
- Opening options from top or side with interfolded one-at-a-time dispensing.
- Features to serve the toweling industry for food service and industry cleaning and hand wiping.
- Leading to a new generation of consumer packaging such as more decorative napkin containers that can sit right on the counter or table.

S&S, with its Product Development team, has transitioned from a market support role to a pro-active market-driven approach. "In the last few years, we have realized that we needed to address a changing climate," says Tom Gazdik, Marketing Director. "Increasingly, we can offer new direction for folded product formats in markets approaching saturation with older product styles."

Date of Launch: February, 2006 at S&S Specialty Systems Open House

Contact: Tom Gazdik, Marketing Director - S&S Specialty Systems 715-372-8988

TGazdik@SSSpecialtySystems.com

H. P. BROWN & C. L. JOHNSTON.

PAPER TOWEL AND TISSUE MACHINE.

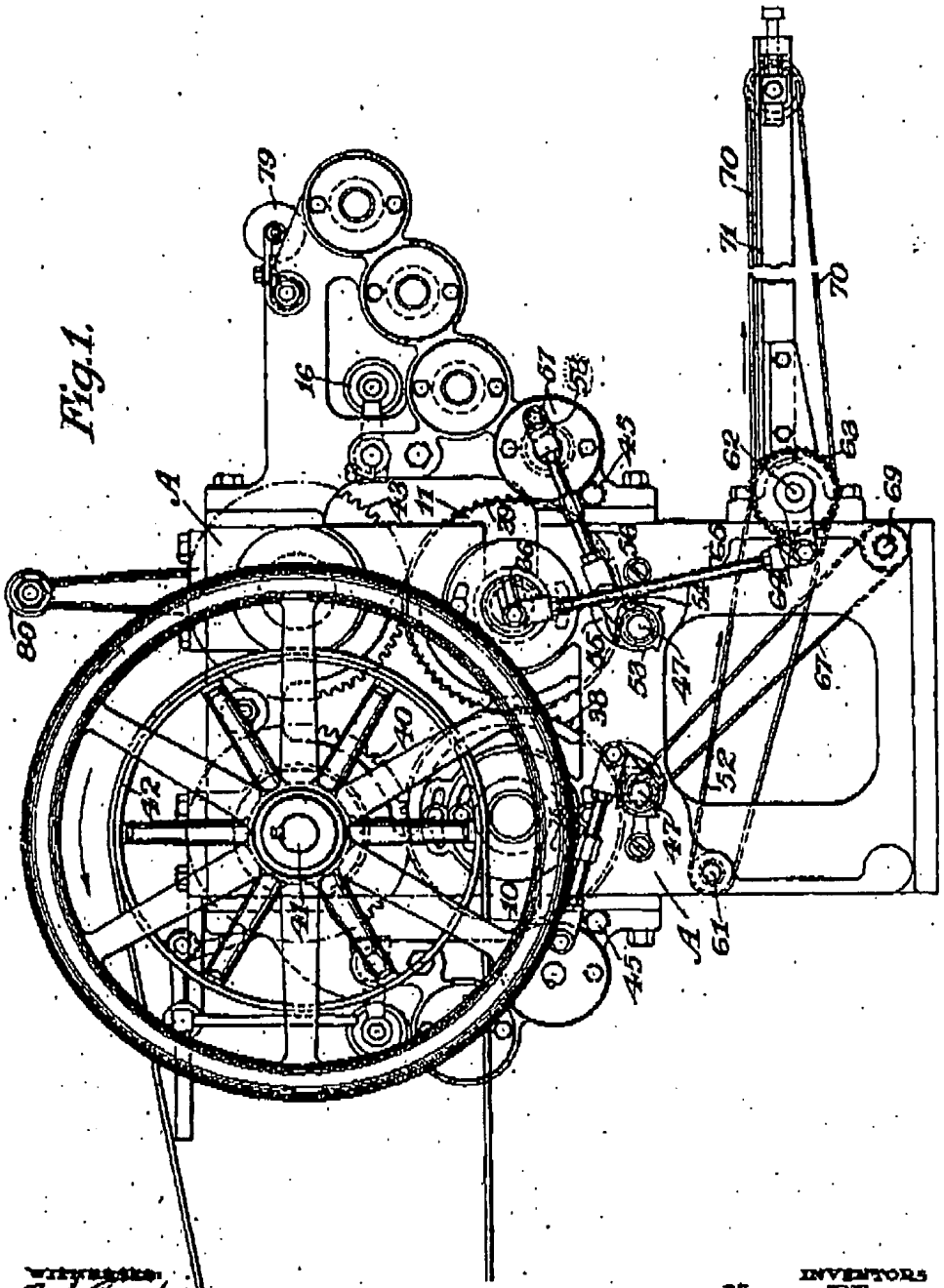
APPLICATION FILED OCT. 2, 1915.

1,219,239.

Patented Mar. 13, 1917.

5 SHEETS—SHEET 1.

Fig. 1.



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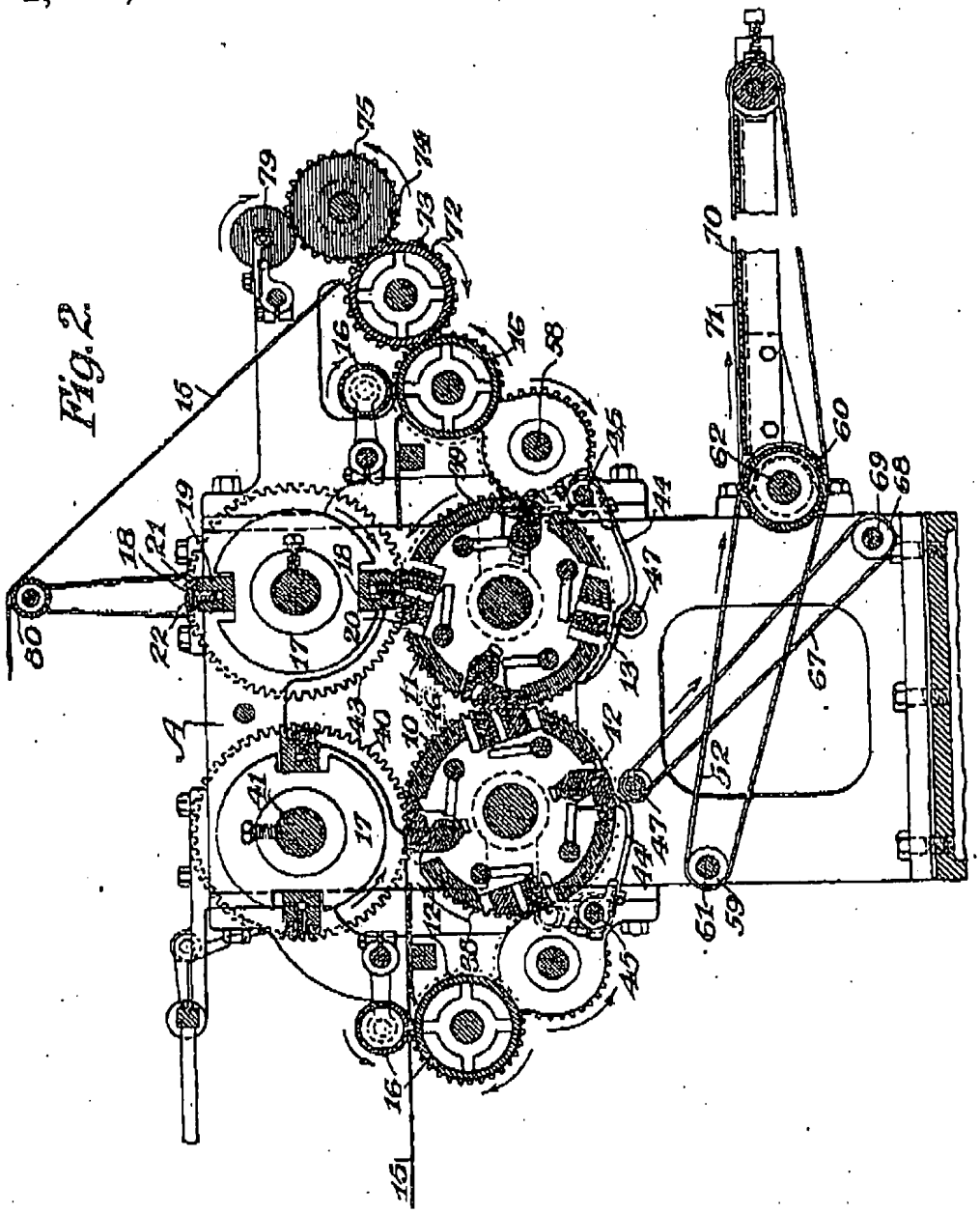
5 SHEETS—SHEET 2.

Fig. 2.



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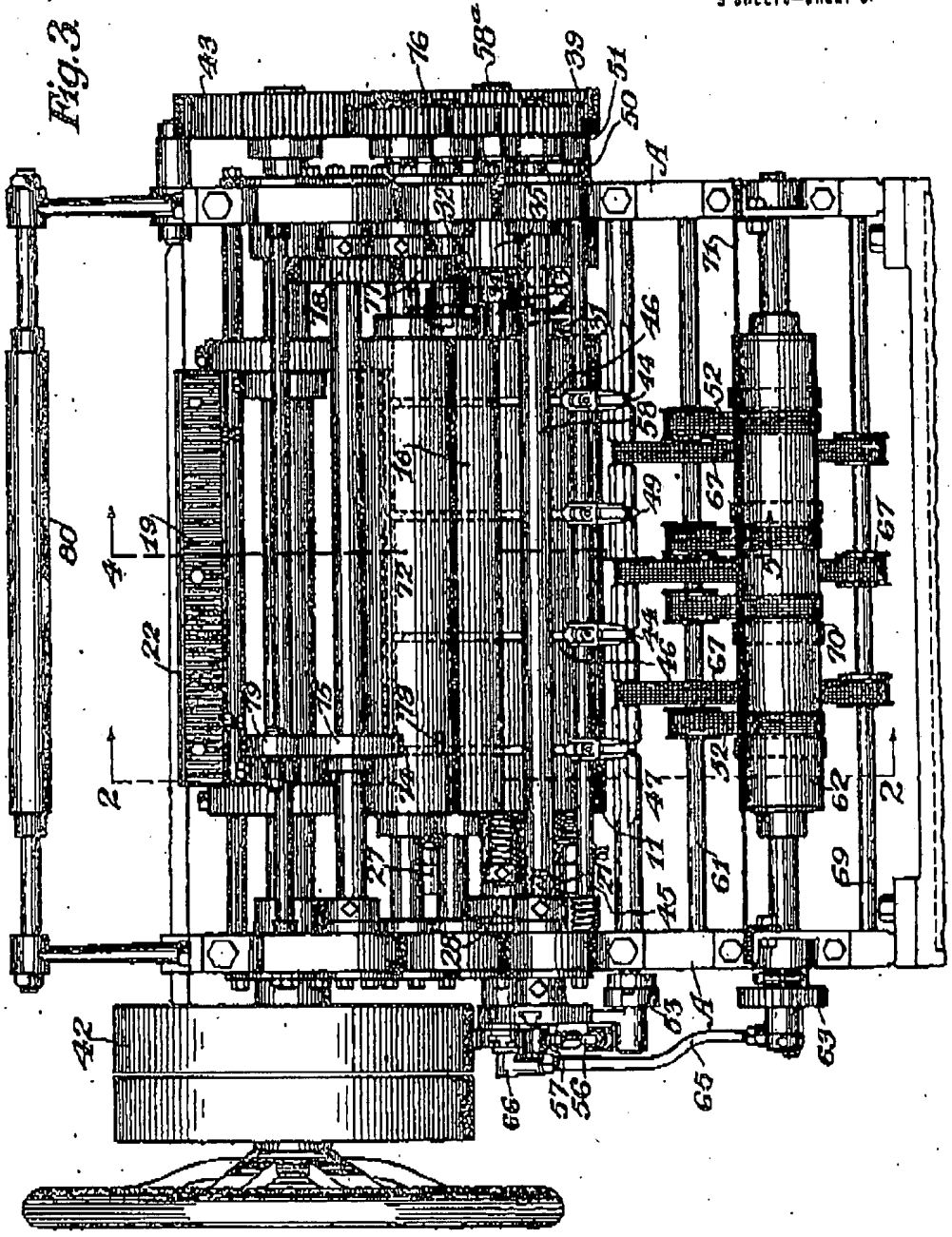
5 SHEETS—SHEET 3.

Fig. 3.



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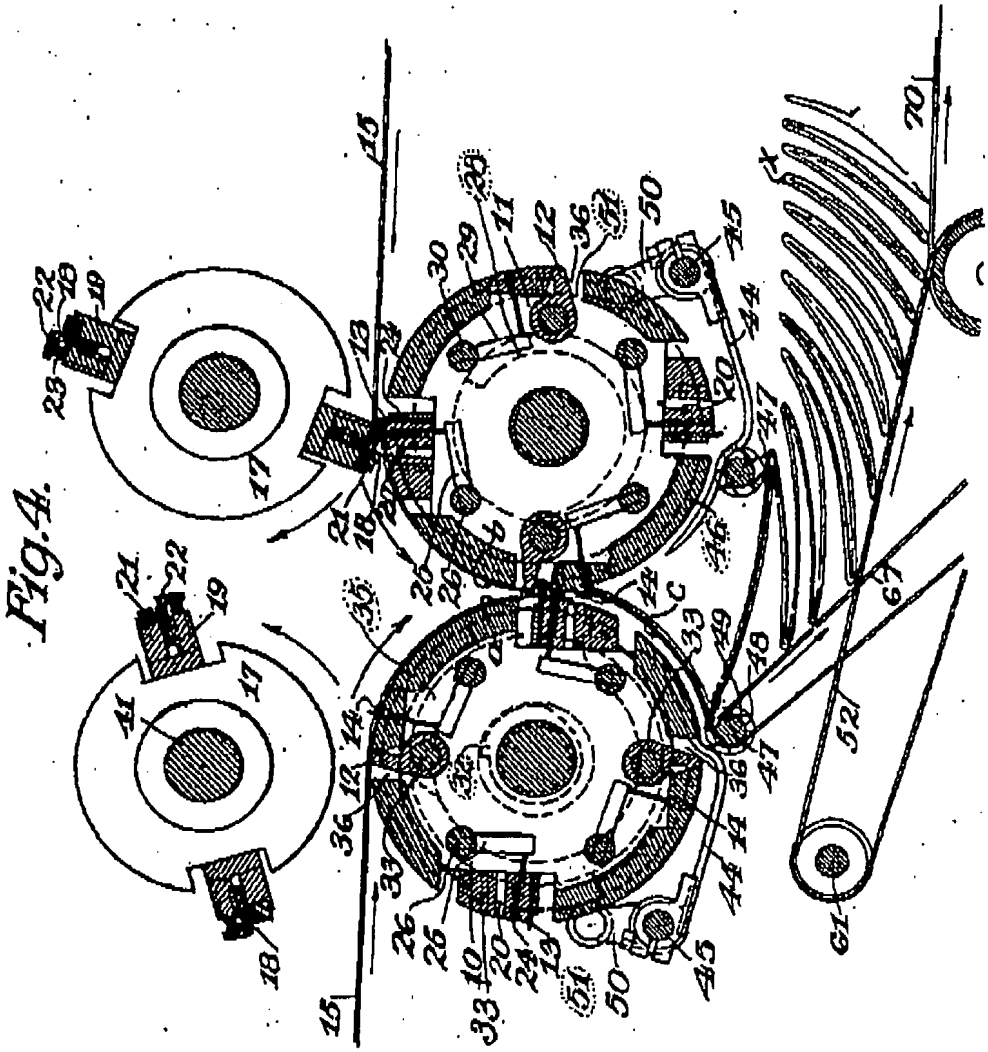
5 SHEETS—SHEET 4.

Fig. 4.



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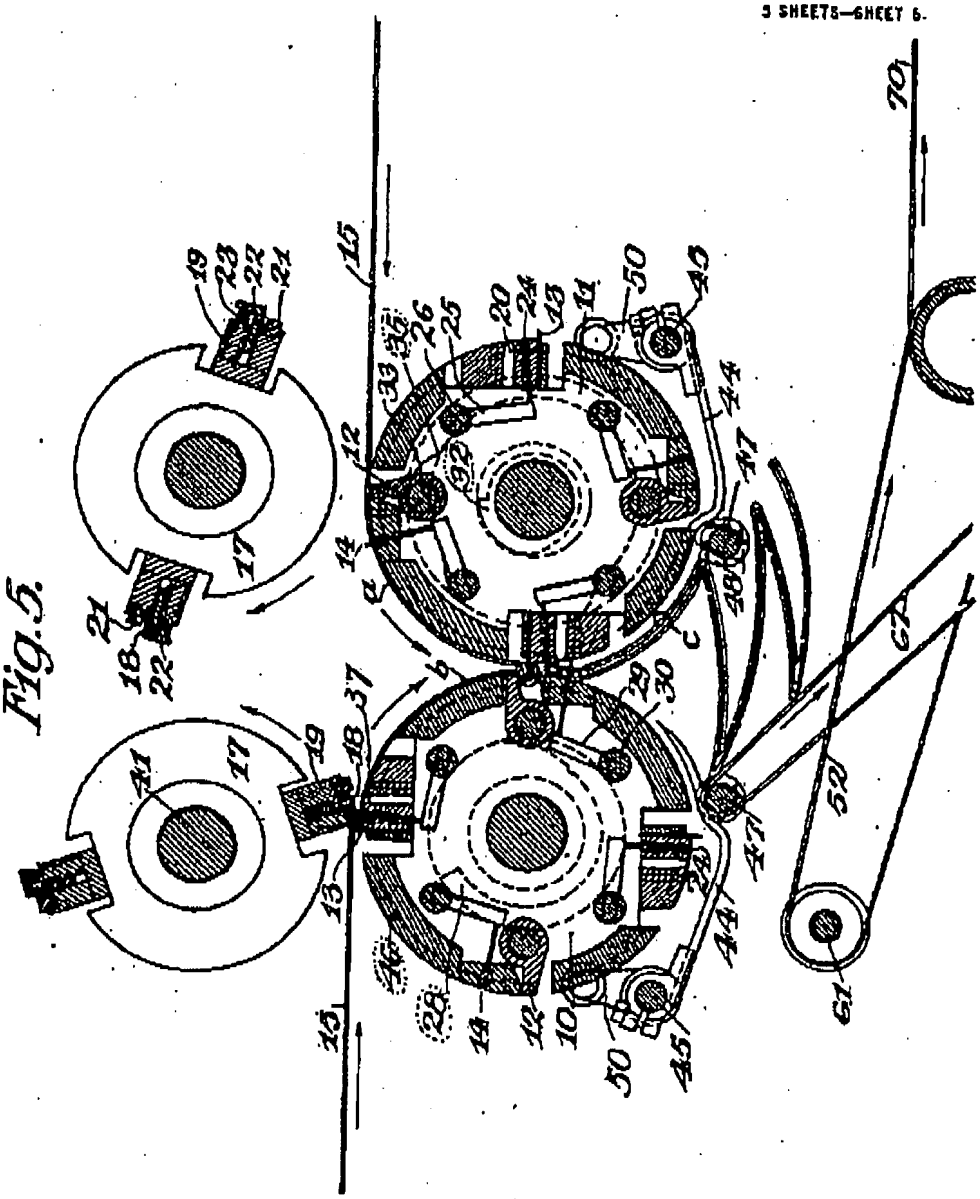
APPLICATION FILED OCT. 2, 1915.

1,219,239.

Patented Mar. 13, 1917.

3 SHEETS—SHEET 5.

Fig. 5.



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UNITED STATES PATENT OFFICE.

HORACE P. BROWN AND CLARENCE L. JOHNSTON, OF OAKLAND, CALIFORNIA.

PAPER TOWEL AND TISSUE MACHINE.

1,219,239. Specification of Letters Patent. Patented Mar. 13, 1917.

Application filed October 2, 1915. Serial No. 53,726.

To all whom it may concern:

Be it known that we, HORACE P. BROWN and CLARENCE L. JOHNSTON, citizens of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Paper Towel and Tissue Machines, of which the following is a specification.

This invention relates to means for cutting, folding and interleaving paper towels and tissue; and has for its object to simplify and improve the construction and operation of such means, and facilitate the delivery of the folded material from the machine.

In carrying out this object, we employ, in connection with improved cutting, folding and interleaving devices, which are of the general type disclosed and claimed in our co-pending application No. 806,722, filed December 15, 1913, a series of stripper fingers operable to remove the folded paper from each cylinder as soon as released by the folding jaws thereon; a tumbler bar coacting with each series of stripper fingers to turn the folded paper in regular order away from the cylinder and direct it upon traveling belts, which belts carry the material in interleaved stacks to a receiving bench, from which an attendant may remove same for bundling and wrapping, and means, in connection with the machine, for printing at regularly spaced intervals a mark upon the paper as it is fed in a continuous web to the folding cylinders, in such a position that the mark will appear upon the exposed edge of certain of the folded papers to indicate to the attendant the quantity delivered.

One form which our invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of a machine embodying our invention.

Fig. 2 shows a sectional view of the same taken on the line 2—2 of Fig. 3.

Fig. 3 shows an end elevation of the machine shown in Fig. 1.

Figs. 4 and 5 show diagrammatic views of the machine, taken on the lines 4—5 of Fig. 3, and illustrating different positions of the mechanism therein.

Referring now in detail to the form of our invention illustrated, it will be seen that the machine comprises, generally, a frame A carrying coöperative folding and interleaving cylinders 10 and 11, arranged in pairs, each being provided with diametrically opposed gripping jaws 12 and folder blades 13, alternately spaced, the gripping jaws on one cylinder being timed to coact with the folder blades on the opposite cylinder, and transfer pins 14, adjacent to each jaw, to carry the folded paper from one cylinder to the other, so that the pieces are delivered alternately by the cylinders in folded and interleaved stacks. Paper is fed in continuous webs 15 to opposite sides of the machine, passing through feed or guide rollers 16 and over the adjacent folding cylinder where a severing device 17 coöperates with each cylinder to cut the paper into suitable lengths for forming towels and the like.

Each severing device comprises a pair of diametrically opposed, stationary cutting blades 18, carried on rotatable arms 19, which blades are adapted to coöperate with and enter a slot 20 formed in the cylinder adjacent to each folder blade 13. A rubber gripping block 21, carried on each arm 19 in front of each blade 18, upon coming in contact with the cylinder engages the paper and positively holds it against tearing or slipping until it has been severed by the blade 18 entering the slot 20, as best shown in Fig. 2.

Immediately in the rear of the cutting blade 18 and attached to the arm 19 is a guard block 22 normally pressed outward by a spring 23 and which, upon meeting with the adjacent cylinder, forces the severed end of the incoming web of paper down adjacent to the folder blade, while a set of pick-up pins 24, carried on the cylinder and movable outwardly, pierces the leading end of the paper and retains it in place compelling the web to be drawn around with the rotating cylinder. This guard block, being normally projected, comes in contact with the cylinder before the blade 18 enters its slot; and in conjunction with the gripping block 21 serves to hold the paper taut while the blade is doing the severing. The guard block, thereafter, strips the paper from the blade and holds it in position to permit the pick-up pins to engage the same.

The pick-up pins 24 (two sets to each cylinder) are mounted on arms 25 fixed to a tension rock shaft 26 which carries at one end a crank connection 27 operating inside a stationary cam 28 fixed to the frame. The transfer pins 14 are likewise carried on arms 29, fixed to a tension rock shaft 30 con-

trolled in its movement by a crank connection 31 with an external cam 32; whereas the gripping jaws 12 in each case are carried on a similar rock shaft 33 having a crank connection 34 with an internal cam 35. Each of said rock shafts, it will be noted, extends through the hollow cylinder and is controlled in its movement by a separate cam mechanism; the whole being timed in proper order to produce the desired operation.

Each gripper jaw operates in a slot 36, formed in the wall of the cylinder, and is normally engaged with one side thereof, but when nearing contact with the folder blade on the opposite cylinder is caused to be opened by the cam 35, whereupon the folder blade forces a bight of paper therein, consisting of two sheets, as shown in Fig. 4; one sheet *a* being creased near its severed end and the other sheet *b* being creased near its middle on account of entering upon opposite cylinders. Immediately the jaw is closed to engage the bight of paper and the transfer pins 14 adjacent to the jaw are moved by their cam mechanism into engagement with openings 37 in the opposite cylinder, thereby impaling the sheet *b* and also the sheet *c*, (sheet *c* being the one on the opposite cylinder preceding sheet *a*), and causing said sheets to be transferred to the adjacent cylinder. As the members turn away from each other the folder blade is withdrawn from the jaw and the sheet *a* removed from the pick-up pins and the paper carried with the jaw to a point near the bottom of the travel of the cylinder where it is released, depositing the lag end of the sheet *c* interleaved partially with the sheet *b* and with the front portion of the sheet *a*. The leaves thus delivered consist of a sheet folded on a median line and also near its margin, said sheet overlapping half its distance with the preceding sheet and being overlapped the remaining distance by the succeeding sheet.

The cylinders 10 and 11 are geared together by spur gears 38 and 39, respectively, gear 38 being driven by a spur gear 40 on a shaft 41 of the adjacent severing device, which latter shaft constitutes the drive shaft and is operated by a drive pulley 42. The opposite severing device is driven by a spur gear 43 from the gear 39, the speed of the cylinders and severing devices being uniform.

As will be understood, the folded strips of paper are delivered alternately by the cylinders in interleaved stacks, and it has been customary heretofore to allow the material to fall directly beneath the cylinders in piles to be removed by hand at intervals. We have devised simple and improved mechanism to deliver the folded material directly from the cylinders to one side of the machine in compact and continuous order, with the folded strips in inclined position and marked at regularly spaced intervals on the exposed edge of certain of the strips so that the attendant may easily remove from the delivery table counted piles of the material for wrapping the same.

This delivery mechanism comprises a series of stripper fingers 44 for each cylinder, carried on a tensioned rock-shaft 45 and adapted to enter circumferential grooves 46 formed in the cylinder. Lying below, and adjacent to each series of stripper fingers, is a tumbler bar 47 running the full length of the cylinder and having a plurality of longitudinally arranged ribs or teeth 48 formed upon its periphery and spaced endwise apart to leave circumferential depressions or grooves 49 in line with the fingers. Said fingers normally rest in the grooves 49 of the tumbler bar, and the rock-shaft 45 is operable through a crank connection 50 working on an external cam 51 to push the fingers up into the grooves 46 on the adjacent cylinder in timed relation with the release of the gripping jaws 12, thereby stripping the folded paper therefrom and directing it down against a tooth on the tumbler bar, which tooth turns the edge of the paper downward and away from the rapidly rotating cylinder and on to a belt conveyer 52.

For operating each tumbler bar, we employ a ratchet drive comprising a toothed wheel 53 fixed upon one end of said bar, a vibratile arm 54 adjacent to said wheel and loose on the bar carrying a pawl 55 to engage with the teeth on the ratchet wheel, and a reciprocal rod 56 having a crank pin and disk connection 57 with a shaft 58 driven by the spur gear on the adjacent folding cylinder. The timing between the tumbler bar and cylinder is such that the latter makes two revolutions to one of the tumbler bar, and inasmuch as the cylinder, as now operated, discharges four folded papers in that time, the tumbler bar is provided with four teeth or ribs, one for each paper.

The conveyer belts 52 extend substantially in a horizontal line from beneath one of the folding cylinders to the opposite side of the machine, operating over pulleys 59 and 60. The pulleys 59 are carried idly on a support 61, beneath the cylinder 10, while the pulleys 60 are fixed upon a shaft 62 journaled upon the side of the frame and actuated by a ratchet drive, said drive comprising a ratchet wheel 63, a pawl and vibratile arm 64, and a connecting rod 65 having a crank connection with a disk 66 on the cylinder 11.

Crossing the belts 52 are diagonally arranged belts 67, running at one end over the tumbler bar adjacent to the cylinder 10 and at the other end over idler pulleys 68 journaled upon a transverse support 69 on the side of the frame adjacent to and beneath

the shaft 62. The belts 67, by virtue of their arrangement upon the tumbler bar, prevent the paper from being carried downwardly by the teeth on that bar and away from the horizontal belts 52. Coöperating with the belts 52, and working upon pulleys carried upon the shaft 62, are supplementary conveyers or belts 70 traversing a delivery table 71, at which place an attendant receives the moving stack of folded papers for bundling and wrapping the same.

In order that the attendant shall know, without counting, when the required number of strips of paper is at hand to constitute a bundle, we provide a marking device whereby a folded towel or tissue is marked at regularly spaced intervals in such a way that the mark will be visible to the attendant. This marking mechanism is embodied in the machine adjacent to one set of feed rollers 16 and comprises an impression roller 72 in contact with the driven feed roller and provided with a rubber stop 73 upon its periphery to coöperate with a steel lug or marker 74 upon a marking roller 75. One of the feed rollers is driven by an adjacent idler pinion 58ª on the shaft 58 through a spur gear 76 in mesh therewith, and the impression roller 72 is provided with a spur gear 77 to mesh with the gear 76 on the feed roller, while the marker roller is driven by the impression member by means of a spur gear 78; the train of gears, it will be noted, being driven by the spur gear on the adjacent folding cylinder. The gear 77, on the impression roller, is provided, say, with twenty-four teeth, whereas the gear 78, on the marker roller, has twenty-five teeth.

A composition wheel or inking roller 79 coöperates with the steel lug or marker to supply ink thereto. The paper 15 passes between the marker and impression rollers, around the latter, and through the feed rollers and onto the adjacent folding cylinder.

In the present device, the timing between the marking roller and impression roller is such that a contact between the steel lug and rubber stop takes place at every twenty-fifth revolution, and the timing between the impression roller and the folding cylinder causes the former to make two revolutions to one of the latter. Paper being fed from both sides of the machine onto the cylinders, each revolution of the cylinders produces four folded pieces; which would mean that the marking contact between the impression and marking rollers would occur at intervals of fifty towels. The mark will likewise be printed at a fixed point in the rotation of the rollers. Hence it may be arranged to take place in such a position on the paper as to be visible on the edge of the folded strips presented outward, as at x, on certain of the towels.

In the operation of the device just described, the paper is fed to the cylinders from one side of the machine, one of the webs running above the machine over a bail-shaped guide 80, passing between the marking and impression rollers. The webs entering between the cylinders and cutting devices are severed into strips of the required size, passing thence between the coöperative cylinders where said strips are folded and interleaved and retained by the gripper jaws until the stripper fingers are raised by the rock-shafts to enter the grooves on the cylinders, whereupon the action of the gripper jaws releases the folded strips, allowing the stripper fingers to move the same downward into engagement with a tooth on the tumbler bars. The tumbler bars thereupon turn the edges of the folded strips downwardly and away from the cylinders, allowing the paper to drop upon the traveling belts beneath. The movement of the belts is so regulated that the folded and interleaved stacks of paper, as delivered from the cylinders, are carried along in an even and well ordered arrangement, slightly inclined, as shown in Fig. 4 of the drawings. Then when the stack of papers is delivered to the bench 71, the mark printed on the paper by the marking device appears upon the exposed edge of one of the towels where the operator can see the same and readily determine the exact quantity of towels to be removed to constitute a bundle.

Other forms and arrangements of this device may, obviously, be employed without departing from the spirit of our invention as disclosed in the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is—

1. In a paper cutting and folding device, the combination with coöperative cylinders for delivering folded and interleaved strips of paper, of means for removing the folded papers from the cylinders, means forming rests for said first mentioned means and coöperating therewith for turning the folded papers away from said cylinders, and means for delivering the same in interleaved stacks to one side of the machine.

2. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers for removing the folded papers from the cylinders, rotatable members having peripherally disposed guiding means to turn the papers away from said cylinders, and traveling means to receive the strips in interleaved stacks and deliver the same to a distant point.

3. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers operating in grooves in said cylinders, cam mechanism for actuating said fingers

to cause them to remove the folded papers from said cylinders, means adjacent to cooperate with the stripper fingers for guiding the strips of folded paper away from the cylinders, and traveling means for delivering the strips in interleaved stacks to a distant point.

4. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers operating in grooves in said cylinders, means for actuating said fingers to cause them to remove the folded papers from said cylinders, tumbler bars for guiding the strips of folded paper away from the cylinders, traveling means for delivering the strips in interleaved stacks to a distant point, and driving means for said tumbler bars connected to the cylinders.

5. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of a rock-shaft adjacent to each cylinder, stripper fingers carried by each rock-shaft and operating in grooves in said cylinders, cam mechanism for operating said rock-shafts to cause the fingers thereon to remove the folded papers from the cylinders, tumbler bars for guiding the strips of folded paper away from the cylinders, traveling means for delivering the strips in interleaved stacks to a distant point, and driving means for said tumbler bars connected to the cylinders.

6. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers for removing the folded strips from said cylinders, rotatable tumbler bars to receive the strips from said fingers, and an endless conveyer having a driving connection with one of said cylinders for receiving the strips delivered by said rotatable tumbler bars and delivering the same in interleaved stacks to a distant point.

7. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers for removing the folded strips from said cylinders, rotatable guiding means to receive the strips from said fingers, an endless conveyer having a driving connection with one of said cylinders for receiving the strips delivered by said rotatable guiding means and delivering the same in interleaved stacks to a distant point, and a cross conveyer carried upon one of said rotatable guiding means for directing the strips of paper engaged thereby on to the delivery carrier.

8. In a paper cutting and folding device, the combination of coöperative cylinders for folding and interleaving sheets of paper, gripper jaws on each of said cylinders, folder blades on each of said cylinders coöperating with the jaws on the opposite cylinder, transfer pins on each of said cylinders adjacent to the jaws movable in and out to shift the sheets from cylinder to cylinder whereby the papers are delivered alternately by the cylinders in interleaved stacks, separate cam mechanism for said gripper jaws and transfer pins, means for stripping the folded and interleaved papers from the cylinders, and means for delivering the same in interleaved stacks to one side of the machine.

9. In a paper cutting and folding device, the combination of coöperative cylinders for folding and interleaving sheets of paper, gripper jaws on each of said cylinders, folder blades on each of said cylinders coöperating with the jaws on the opposite cylinder, transfer pins on each of said cylinders adjacent to the jaws movable in and out to shift the sheets from cylinder to cylinder whereby the papers are delivered alternately by the cylinders in interleaved stacks, separate cam mechanism for said gripper jaws and transfer pins, cam actuated stripper fingers operating in timed relation with said gripper jaws to remove the folded papers from the cylinders when the same have been released by the gripping jaws, a rotatable guiding means to turn the papers away from said cylinders, and traveling means to receive the strips of interleaved papers and deliver the same in stacks to a distant point.

10. In a paper cutting and folding device, the combination with coöperative folding and inter-leaving cylinders, of stripper fingers for removing the papers from the cylinders, and rotatable tumbler bars to turn the papers away from the stripper fingers and the cylinders.

11. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers operating in grooves in said cylinders, means for actuating said fingers to cause them to remove the folded papers from said cylinders, and tumbler bars having depressions for the reception of the stripper fingers for guiding the strips of folded paper away from the cylinders.

12. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers operating in grooves in said cylinders, means for actuating said fingers to cause them to remove the folded papers from said cylinders, tumbler bars for guiding the strips of folded paper away from the cylinders, and traveling means for delivering the strips in interleaved stacks to a distant point.

13. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers for removing the folded strips from

said cylinders, rotatable guiding means to receive the strips from said fingers, an endless conveyer for receiving the strips delivered by said rotatable guiding means and delivering the same in interleaved stacks to a distant point, and a cross conveyer for directing the strips of paper engaged thereby onto the delivery carrier.

14. In a paper cutting and folding device, the combination of coöperative cylinders for folding and interleaving sheets of paper, gripper jaws on each of said cylinders, folder blades on each of said cylinders coöperating with the jaws on the opposite cylinder, transfer pins on each of said cylinders, cam mechanisms for said gripper jaws and transfer pins, stripper fingers operating in timed relation with said gripper jaws to remove the folded papers from the cylinders when the same have been released by the gripping means, and rotatable guiding means to turn the papers away from said cylinders.

15. In a paper folding and interleaving machine in combination, a pair of coöperating cylinders, a rotatable tumbler bar adjacent each of said cylinders, and means coöperating with said tumbler bars for transferring folded sheets from said cylinders directly to said tumbler bars.

16. In a paper folding and interleaving mechanism in combination, a pair of coöperating cylinders, stripper fingers for removing folded sheets from said cylinders, and rotatable means for receiving the folded sheets directly from said stripper fingers, said rotatable means being provided with peripherally disposed means for guiding the folded sheets away from said cylinders.

17. In a paper cutting and folding device, the combination with coöperative folding and interleaving cylinders, of stripper fingers for removing the folded sheets from said cylinders, an endless conveyer for receiving the strips and delivering the same in interleaved stacks to a distant point, a cross conveyer for directing the strips of paper to the delivery carrier, and guiding means over which said cross conveyers run for delivering the paper thereto.

18. In a paper folding device, a pair of sheet folding cylinders, means for stripping the folded sheets from the cylinders, tumbler bars adjacent each of said cylinders for guiding said sheets away from the strippers, and conveyers passing around one of said tumbler bars for receiving said sheets from the tumbler bars.

19. In a paper cutting and folding device, the combination with coöperative cylinders for delivering folded and interleaved strips of paper, of oscillating means for removing the folded papers from the cylinders, and means forming rests for said oscillating means and coöperating therewith for turning the folded papers away from the cylinders.

20. In a paper cutting and folding device, the combination with coöperative cylinders for delivering folded and interleaved strips of paper, of oscillating means for removing the folded papers from the cylinders, means forming rests for said oscillating means and coöperating therewith for turning the folded papers away from the cylinders, and means for delivering the same in interleaved stacks to one side of the machine.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

HORACE P. BROWN.
CLARENCE L. JOHNSTON.

Witnesses:
J. M. BUTLER,
A. MACKENZIE.